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BIMarabia

BIM and Project Phasing

Quality of Design or Quality of Data ?

BIM Statistics Research in Jordan 2016

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Dynamo

Introduction
The Great Wall of China

A myth says when the ancient Chinese wanted to live safe; they built the Great Wall of China.
And thought that no one can climb it being intensively so high, but ..!

During the first hundred years after the construction of the wall, China was invaded three times!
And every time the hordes of the ground enemy did not need to penetrate through the wall or climb it ..!
They, however, just had to bribe the wall watchman and enter through the door.

Chinese had been busy building the wall and forget to build the watchman ..!

Building Human Capital, comes before building anything else, and this is what we need today ..
Many problems with BIM adoption..
Not related to hardware or software, these are easy to procure though.

A problem with teamwork spirit like an employee who eradicates a colleague's job. While, if he is smart , supposed to design a program to automate the works instead that!

Building a taskforce and facilitate the going among them is a priority to the leader.
Leadership is moving others towards the goal.

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Written by: Bilal Succar

The BIM Episodes

Exploring the boundaries of Building Information Modelling

We all may have read various definitions of Building Information Modelling (BIM) and most do not provide a comprehensive understanding of the evolving term. This article is no different; it is yet another attempt to define and understand the ever changing boundaries of the BIM concept as well as the ever expanding digital landscape of Architecture, Engineering and Construction (AEC) industry. What I hope to achieve in these blog episodes (posts) is some coverage of BIM's conceptual and practical bases. I have already pre-written a few and will be posting them consecutively.

Episode1: Introduction
Part A: BIM boundaries

The boundaries of Building Information Modelling as a term-definition, set of technologies and group of processes is fast changing even before being widely adopted by the industry. As a term, BIM seems to have somehow stabilised now (see section 2) but as a set of technologies/processes, its boundaries are rapidly expanding. This boundary expansion (and sometimes mutation) is disconcerting in several ways as BIM continues to lack an agreed definition, process maps and regulatory frameworks. However, these concerns are offset by sheer potentials of BIM (as an integrated process) to act as a catalyst for change [1] poised to reduce industry's fragmentation [2], improve its efficiency/effectiveness [3] and lower its high costs of inadequate interoperability [4] .

Part B: The Term itself

For academic researcher, BIM is a new term representing concepts that are not. To them, Building Information Modelling and the other competing terms embody many of the solutions proposed by academia [5] for a long time. For other industry stakeholders (like designers, engineers, clients, construction companies, facility managers, governments...) BIM is also a new term but represents the commercial maturity and availability of the same research concepts. BIM's prominence, as a re-emerging concept, is being fuelled by the increasing availability of processing power, maturing applications, interoperability

discussions (IAI, NIST and GSA) and proactive regulatory frameworks [6].

BIM, how to read the term:

Building: a structural [7], an enclosed space, a constructed environment...
Information: an organised set of data: meaningful, actionable
Modelling: shaping, forming, presenting, scoping…

To best understand this inadequate array of meanings, let's flip the order of the words:

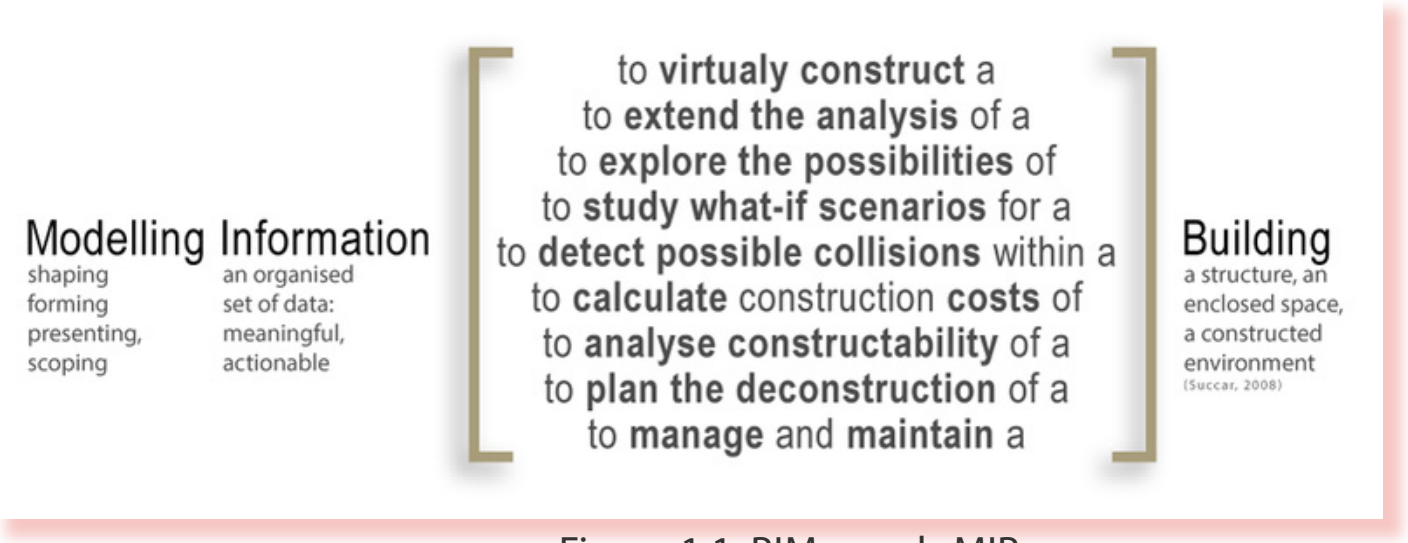


Figure 1.1: BIM equals MIB

The conceptual frameworks of Building Information Modelling stems from the mid 1980's (a topic to be visited in later post) but the term itself is a recent incarnation. My previous attempts to trace BIM yielded an interesting yet lengthy discussion by Jerry Liaserin [8] and his readers. In Comparing Pommes and Naranjas, Jerry provides a sound argument for the acceptance of the term/acronym as is because of its adoption by industry's major CAD developers.

As an acronym, BIM appears to be gradually wining over many competing terms representing mainly similar concepts. Although some researchers [9] attempted to differentiate between them, their extensively overlapping boundaries render the search for their uniqueness somehow unattainable. I do not claim that all these definitions represent the same exact concepts, building's lifecycle stage or expected deliverables but I do claim such comparison /contrast to be an intellectual extravagance.

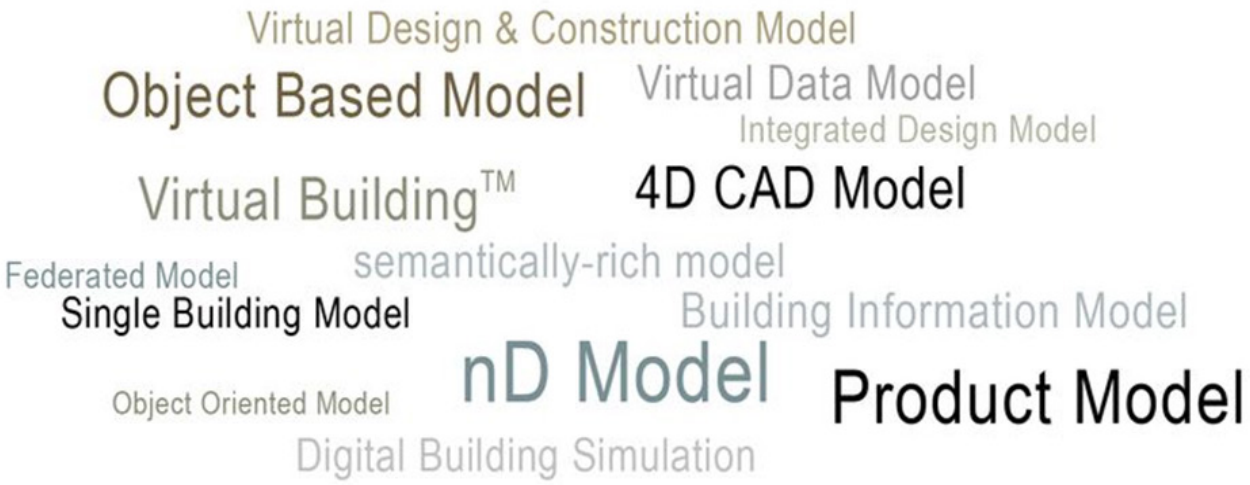


Figure 1.2: Term Soup

To be continued; next Episode will focus on Modelling within Building Information Modelling.

References:

[1] Bernstein, P. (2005) Integrated Practice: It's Not Just About the Technology, http://www.aia.org/aiarchitect/thisweek05/tw0930/tw0930bp_notjusttech.cfm accessed December 5, 2005

[2] Dawson, A.(Ed.) (2004) The Building Technology and Construction Industry Technology Roadmap Report, Collaborative Working In Consortium (CWIC), Melbourne, pp. 13, 32

[3] Hampson, K. and Brandon, P. (2004) Construction 2020: A Vision of Australia's Property and Construction Industry Report, CRC Construction Innovation, Australia, pp. 20

[4] National Institute of Standards and Technology (2004), "Cost Analysis of Inadequate Interoperability in the U.S. Capital Facilities Industry", Maryland, United States

[5] Khemlani, L. (2005) Academic Research in Architectural Computing, http://www.aecbytes.com/buildingthefuture/ArchComputingResearch.htm , accessed December 1, 2005

[6] Newton, R. S. (2005) AISC Updates Contract Standards to Reflect Model-Based Structural Engineering, http://aecnews.com/articles/1056.aspx , accessed December 4, 2005

[7] Oxford English Dictionary

[8] Liaserin, J. (2002), Comparing Pommes and Naranjas, http://www.laiserin.com/features/issue15/feature01.php , accessed November 12, 2005

[9] Lee, A., Wu, S., Marshall-Ponting, A., Aouad, G., Cooper, R., Tah, J. H. M., Abbott, C. and Barrett, P. S. (2005) nD Modelling Roadmap: A Vision for nD-Enabled Construction, University of Salford, Salford, p. 96

http://www.bimthinkspace.com/2005/12/bim_episode_1_i.html

With the revolution of database engines and the evolution of the computers industry, the companies had to make their own revolution of software's specially the building design software.
GIS software has preceded the architecture and construction field in implementing the database in its programs which changed the way we draw , we started drawing objects rather than lines.

Architecture and construction applications found in BIM the last piece that was missing to make a huge revoltionary step which we see clearly by comparing AutoCAD to Revit as applications.

Despite the fact that big companies and corporates started monopolizing the market like how Autodesk bought 3Ds max, Maya, Robot Structural Analysis , they were unable to make the wishes of users become true and we can see this clearly by checking the wishlist for any program against the requirements of other companies and other regions.

This was the time for the small companies to enter the BIM field which helped most of the programs to have (SDK Software Development Kit) or (API Application Program Interface) which allows you to use the program codes and functions to make other functions.

So now you can stop waiting the updates and newer versions, you can start participating in programs and implement your ideas in the programs and we experienced this in many programs like Revit – Tekla – Stucad to develop then and make custom applications for other companies.

The problem faces small companies is how to market their products facing the big whale companies which have resources (i.e.: money or reputation)

Participate in BIM

But now there is some chance made by the big companies like:

1- Companies that adopt the idea of supporting the uprising companies if the big company like the idea like Trimble

http://www.trimble.com/Corporate/Small_Business.aspx

2- Companies that made an app store like the mobile apps

https://apps.autodesk.com/en

We had an experiment that made an add on Revit program which draws and reinforces the columns automatically.

https://apps.autodesk.com/RVT/en/Detail/Index?id=6421993304917230909&appLang=en&os=Win64

3- Besides the competitions that some big companies make to support the uprising companies

http://www.mitarabcompetition.com/

http://astf.net/

And thank God we were the winner in one of the competitions of Arab Science and Technology Foundation

4- As for the Egyptian companies there is http://www.itida.gov.eg/En/Pages/home.aspx We are a member there

I am using BIM so how to participate:

1- Learn how to program and how to use the SDK or API of various programs also learn some programming languages including C# - Visual Basic.net – Python- Rubby- C++

In addition to a rocking visual programing language, yet to get mature, like Dynamo.

2- Participate with ideas, every great work started as a small idea even if you can't make it, you can help other programmers make it. To enrich our participation in BIM field we have to cooperate because the government don't make cooperation plans with specialized universities in programming and computer science.

The Turkish experience is a great example on how they have the Prota program http://www.protayazilim.com/, which came from a good cooperation between programmers, math teachers and other specialized personnel supported financially by the government so they have now a program that provides the country with enough products needed internally even if it didn't compete globally.

I would like to share some thoughts and market direction instead of just talking about the Autodesk app store and if readers would like to know about the app store tool, how it helps in marketing and how to earn from it we will write about it in another time.

From the thoughts that may find attention:

1- Optimization: is a field where you study how to use the least energy, materials, and work hours to produce. Just put the word least in any useful sentence and everyone will seek you for work. This field still needs engineers and doesn't have any efficient programs to work out the optimal solution, so the idea her is to cooperate with different engineers to make a program that makes the optimal solutions.

2- Automatic Generation: this is how to make the program shorten the steps required to do something by making a system, you use it through certain procedures fulfilling some criteria required as for example on the EnrColumn tool.

3- Standardization: supporting programs that depends on standard specifications and converting your tools according to the standard specifications or making standard specifications for topics not included yet like adding your specifications to the Industry Foundation Classes (IFC).

4- Recognition: the world now has so much data(written , photographed or taped) , the way to invest these data and process is to make them useful employable information.

5- Virtual Reality – Augmented Reality – Hololens : in this point all I need you to research those words and think how to use this technology in your field

At last all what I want from this article is to make us think out of the box and no matter how impossible you may think it is, may be mentioning this to another person will make it possible. The programming now is available science and many countries are preceding us. At the end remember that the managers of APPLE, GOOGLE come from India, this didn't come from nothing but came through the huge effort.

BIM and Project Phasing

Yosef Rabeai

Sara Marashly

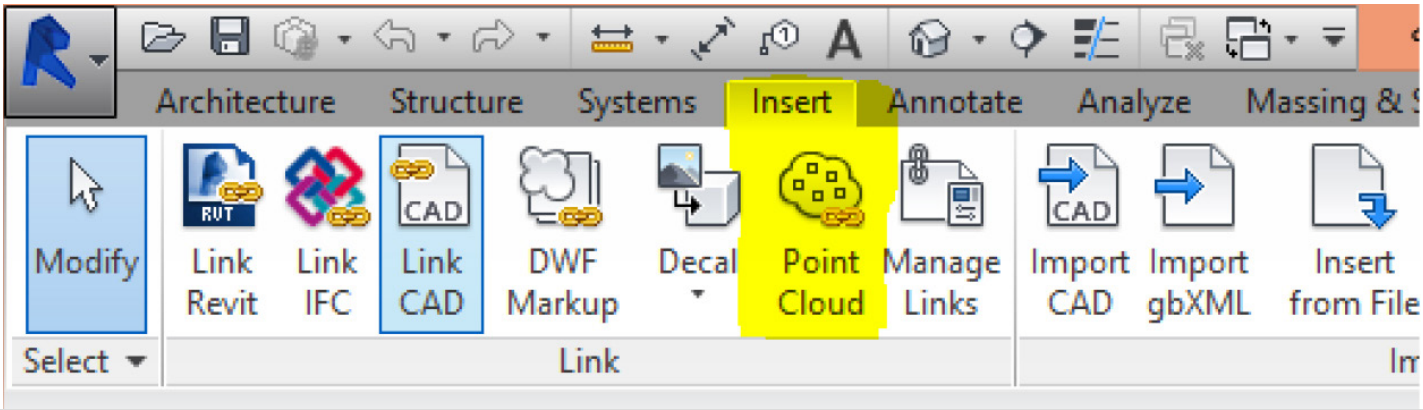
Many construction projects are implemented in several phases, and some projects make us expose to the demolition of some parts of the building for either expansion or repairs and restoration.

For instance, some projects of residential communities are constructed over more than a phase for collecting revenues after marketing the first phases, which can be invested in building other phases, and each phase will have certain time along the project life cycle span.

It is known that the concept of BIM is to represent the project data in a single digital file, the model, including elevations, sections, details, take off schedules, addresses of suppliers, as well as the implementation phases which are the main subject of this article.

Before going deeper into the goal of this article, it is good to note that in certain situations, often experienced in expansion projects of an existing building, it is necessary to model the existing part of the building as well as identify parts of the building to be demolished for this expansion. One model should include all parts of the building whether it is built, will be built, or will be demolished.

To represent the existing part of the building on BIM softwares, a 3D laser scanner will be used, which is a surveying device - more information on 3D scanner can be found in the seventh issue - that represents the object or building via millions of points that reflect the geometry and dimensions of the building and then these data will be plugged into BIM programs -specifically Revit – for instance- by inserting the point cloud file through “Insert” menu and select “Point Cloud”.



The program puts the inserted file, which expresses these observations in the path specified automatically in the files path, and to know this path we go to:

Application menu> Option> File Location> Root Path for Point Clouds.

Using Revit in the Management of Project phases

Overview

- Revit program gives us the ability of creating the implementation phases of a project - for example - if we imagine a project consisting of several buildings, we can determine the construction phase for each building where Building 1 is constructed, then Building 2, after that Building 3, and so on....

- Also it is easy to apply a view filter to identify the items that are displayed within the drawing area which will be constructed in one phase or another, that will be explained on the next paragraphs.

- A Quantity Take-off can be made for a certain phase of the project without the need to do it for the whole project elements. For example:

Creating a quantity take off for doors that will be set in Phase 1 excluding the existing doors of the existing part of the building or the doors to be set at a later phase.

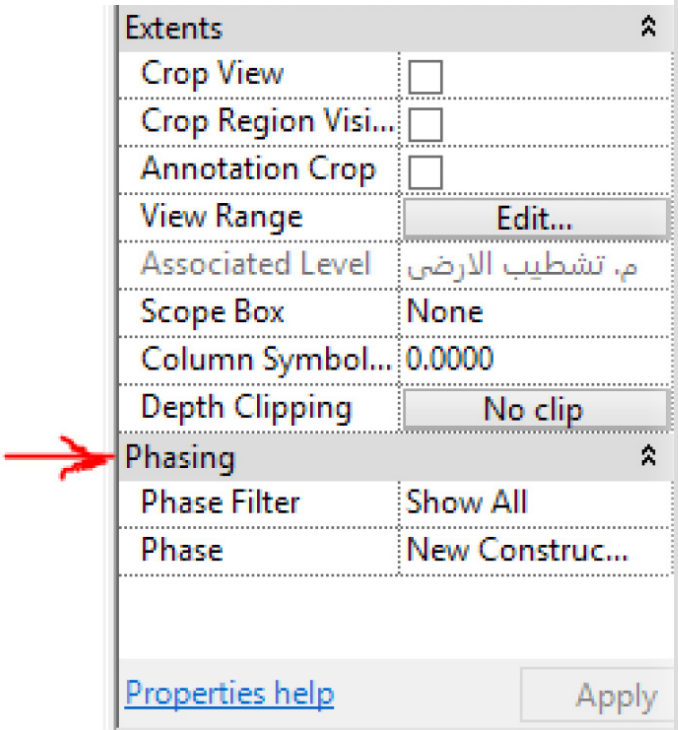
There is a chance to create divisions of the project browser to classify the views regarding the stages of project implementation.

Characteristics of phase properties:

- When one phase is created, some elements will be assigned to certain characteristics for this phase.

Example: The foundation stage includes normal footings, reinforced footings, and beams

in addition, we can duplicate the view more than once and apply a phase for each phase view, as well as customize a phase filter for each view.



Phase properties can be divided into two groups:

1 - Phase Properties for Views

Phase> Specifies the name of the stage that is assigned to the view.

Phase Filter> lets you control how items are viewed within the drawing area.

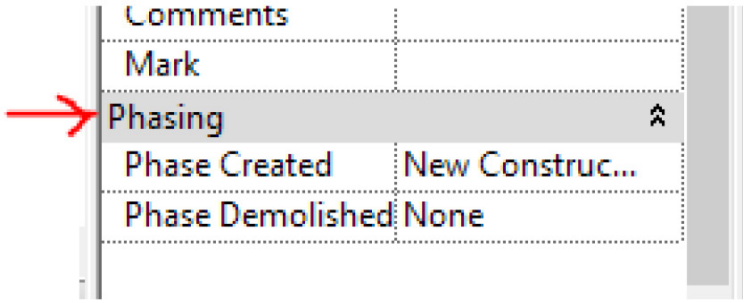
Example: the walls that will be demolished later are painted with distinctive color lines and a dashed line while the existing walls are drawn in black and a continuous line.

2- Phase Properties for Elements

Each element formed within Revit project has two properties:

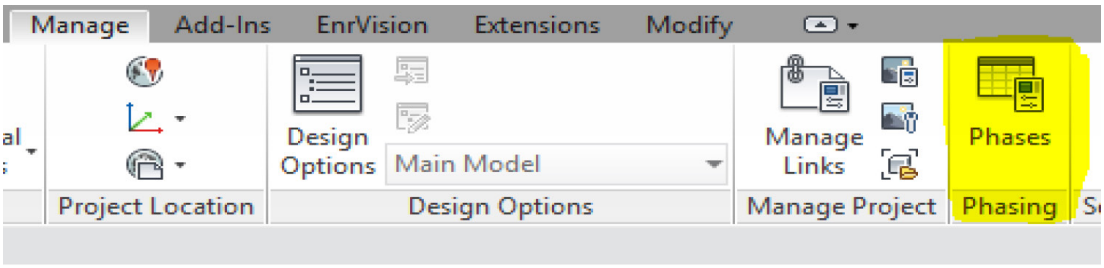
Phase Created> is a property that specifies the phase at which this element was created and automatically takes the same phase as the phase property for views.

Phase Demolished> is the stage at which the element will be demolished. It is useful if the project contains temporary structures or part of an existing building that will be demolished for renovation or expansion.

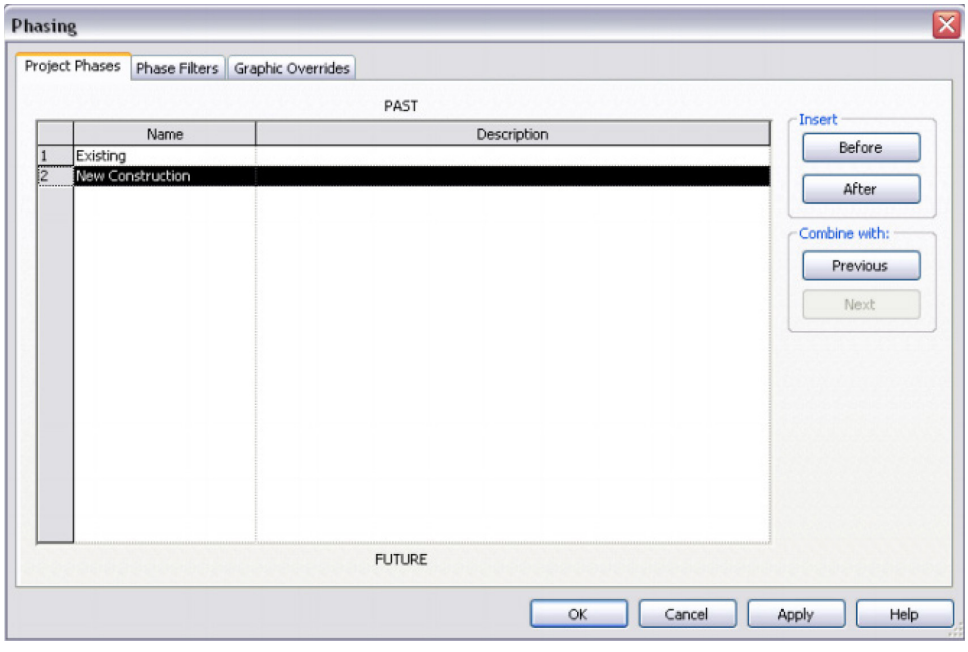


Creating Phases:

To create the phases that the project will pass by, choose Manage tab and from the Phasing panel choose Phases as shown in the image



The following view will appear.



We note that:

- The construction phases are arranged from oldest to latest in order, according to the number in the left side of the phase name so we note the words past and future at the top and bottom of the table in the image to illustrate the chronological order.

- We also notice that there is a construction phase called existing which is the phase that is supposed to contain elements that already exist like buildings already exist and will not be built, if any.

To create a new phase> either change the name of the existing phase or choose anyone and then go to insert on the right side of the image and choose after or before according to the order required.

To combine two phases together> choose a phase, choose combine, then choose next or previous as desired, to become one phase.

Phase Filters

The filter is a property applied to the view for controlling the way the model elements are displayed within the drawing area based on another feature called phase status.

Phase status> distinguish the elements of the model as follows:

(New) - An element that will be created at the current phase.

(Existing) - An element that was created at a phase preceding the current phase and still exists at the current phase.

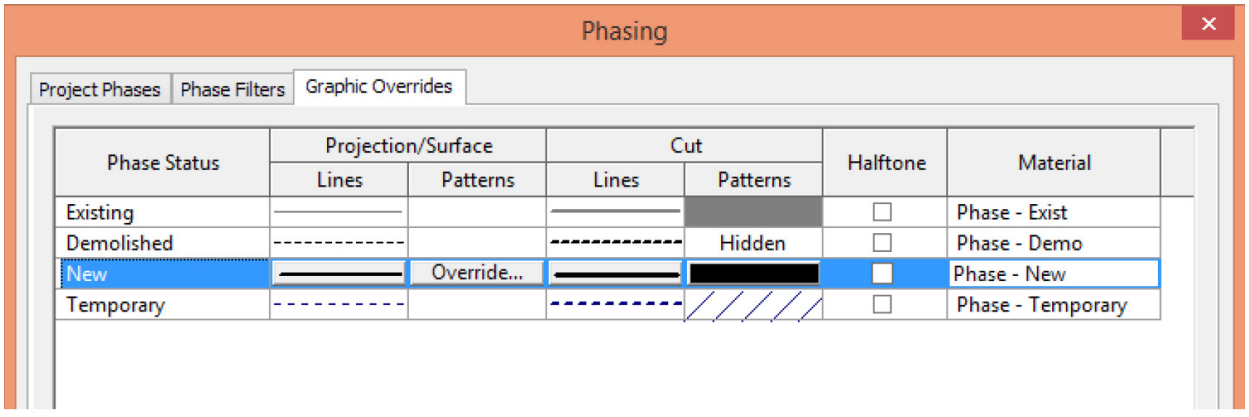
(Demolished) - An element that will be demolished at the current stage.

(Temporary) - A temporary component that is created and demolished at the current phase, such as scaffolding or temporary construction.

Note >> the current phase is the phase specified in the view phase.

>> Each Revit project has default phase filters.

Show All> This filter shows the new elements as specified in the program, and the remaining elements (existing, demolished, temporary) as specified in the Graphic Overrides settings and can be modified as desired.



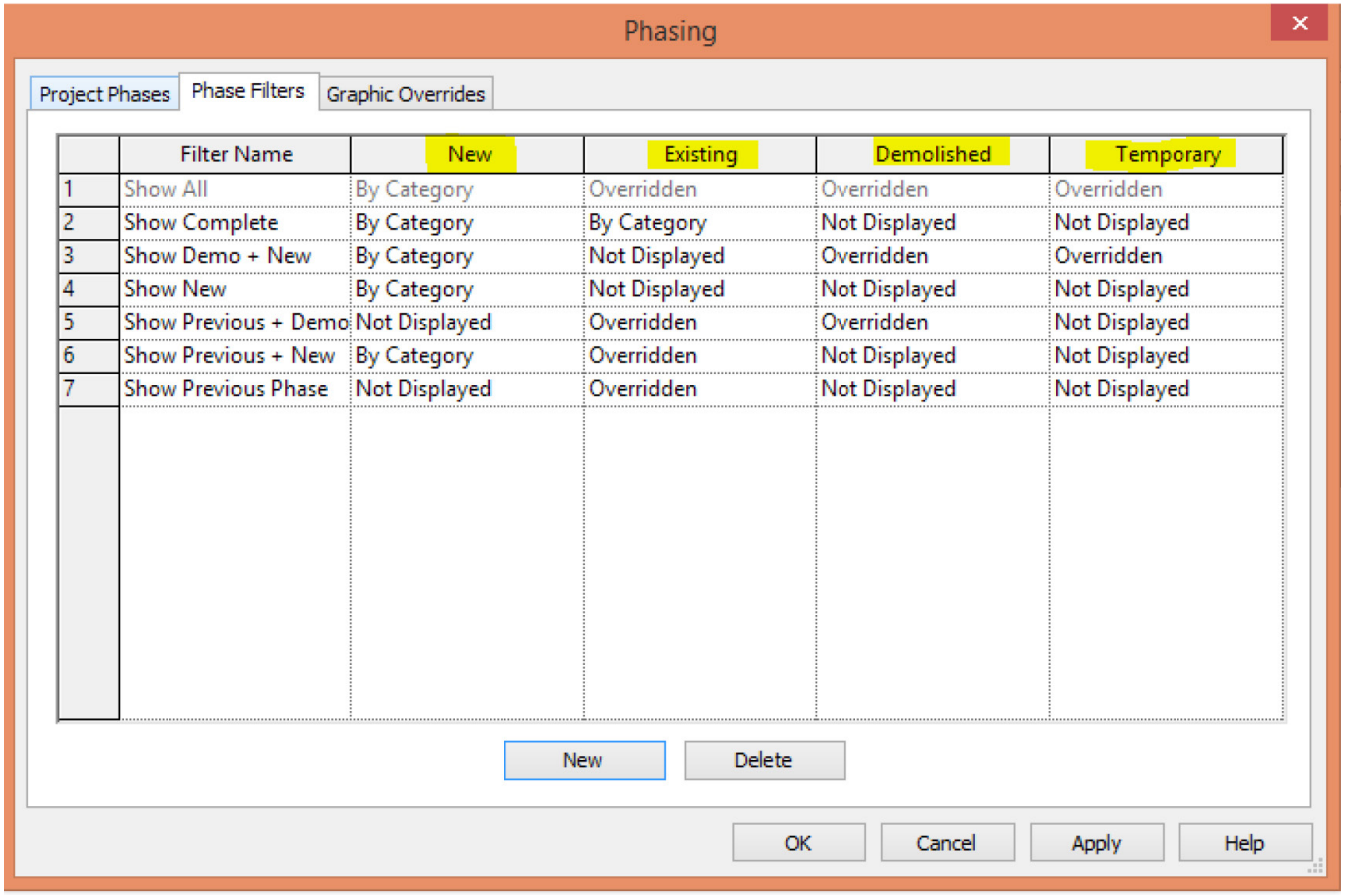
#Show New> this filter shows all the new elements in the model

Show Previous + Demo> this filter shows elements from previous phases with that will be demolished at the current phase.

#Show Previous + New> shows the new elements in addition to the elements of the previous phases.

#Show Previous > shows the elements that are created in the previous phases, and when it is applied at the first phase, nothing will be shown.

Note< see the relation between phase status and filters in the following diagram



Creating Phase Filters:

from Manage tab under phasing, choose phase. From the window that will appear, select the Phase Filters tab, choose new, then type the filter name and select the view you want.

Apply Phase Filters on view:

Open the view you want to customize a filter for, and from phasing in properties, select the filter you want.

Demolishing Elements:

Demolition tool is used to mark the element that will be demolished at the current stage

- In case of demolishing an element in a specific view, this element will be considered as it has been demolished in all other views that have the same phase.

Note >> When you create and demolish an item in the same phase, it will be considered a temporary item.

Using the Demolish Tool 

Select the item you want to remove and from the Modify tab go to the geometry panel and choose demolish.

Mathematical Relationships in Dynamo

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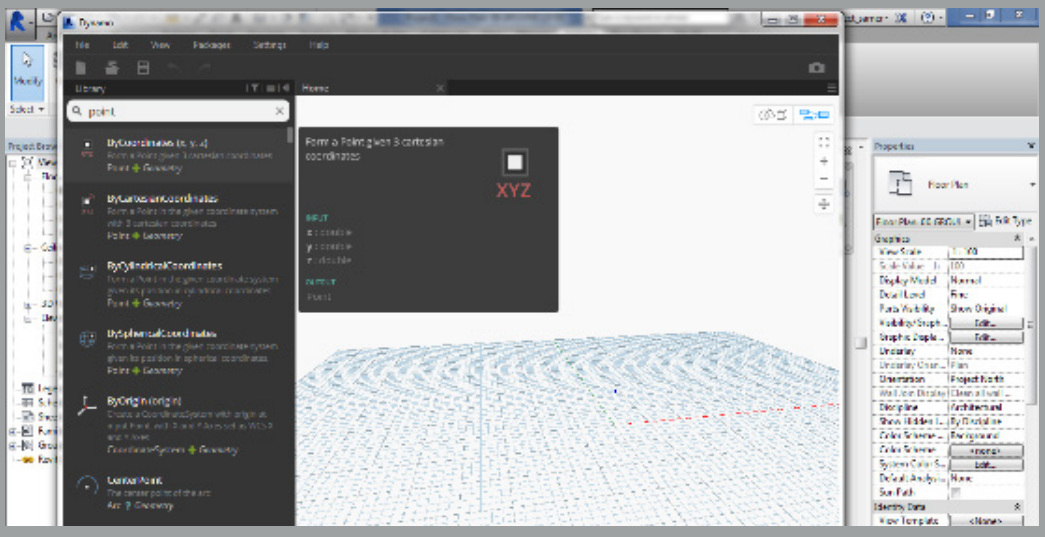
Translated by Eng. Ahmed Yahia

(3rd lesson)

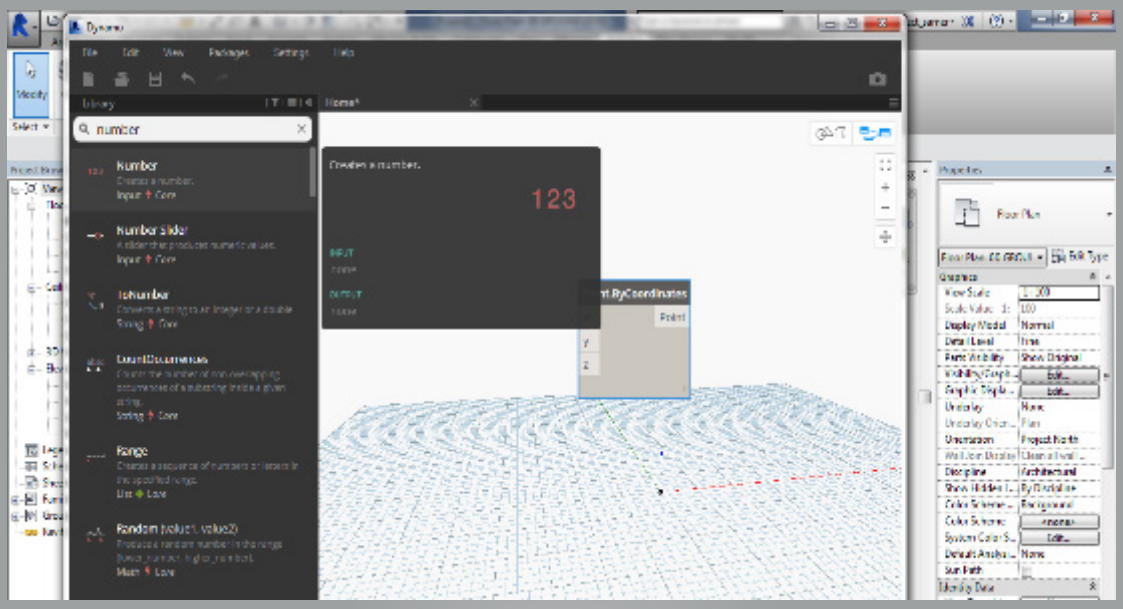
Lesson 3: Designing a certain tree configuration using Revit and Dynamo hand in hand.

A summary concluding the previous lesson will be made to introduce the new chapter, which will help us in linking Autodesk Dynamo with Autodesk Revit and applying some mathematical relations which were mentioned in the previous lesson. As previously mentioned, Dynamo eased the usage of different mathematical applications and relations in the process of architectural design, using this feature we will design the tree configuration using the same mathematical formula previously mentioned: *the sin curve*.

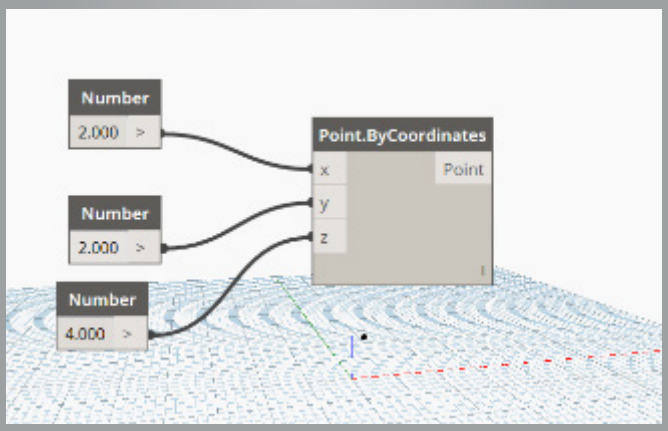
1- Use the search bar to search for a point and choose “By Coordinates X, Y, Z” a point will be set but undefined, and its coordinates must be defined.



2- In this step a new elements will be added “Number” in order to define the 3 coordinates of X, Y and Z using 3 points for each axis

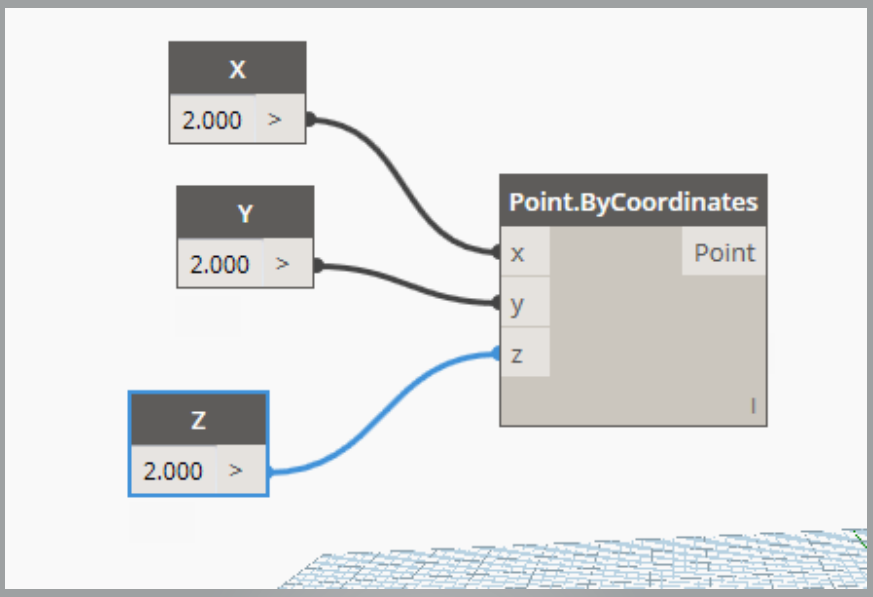


3- After setting and defining the point with a number, copy and paste this point (Using CTRL+C, CTRL+V) 3 times, assumingly now this point will be shown in the middle of the document and can be moved using the numbers defined earlier.



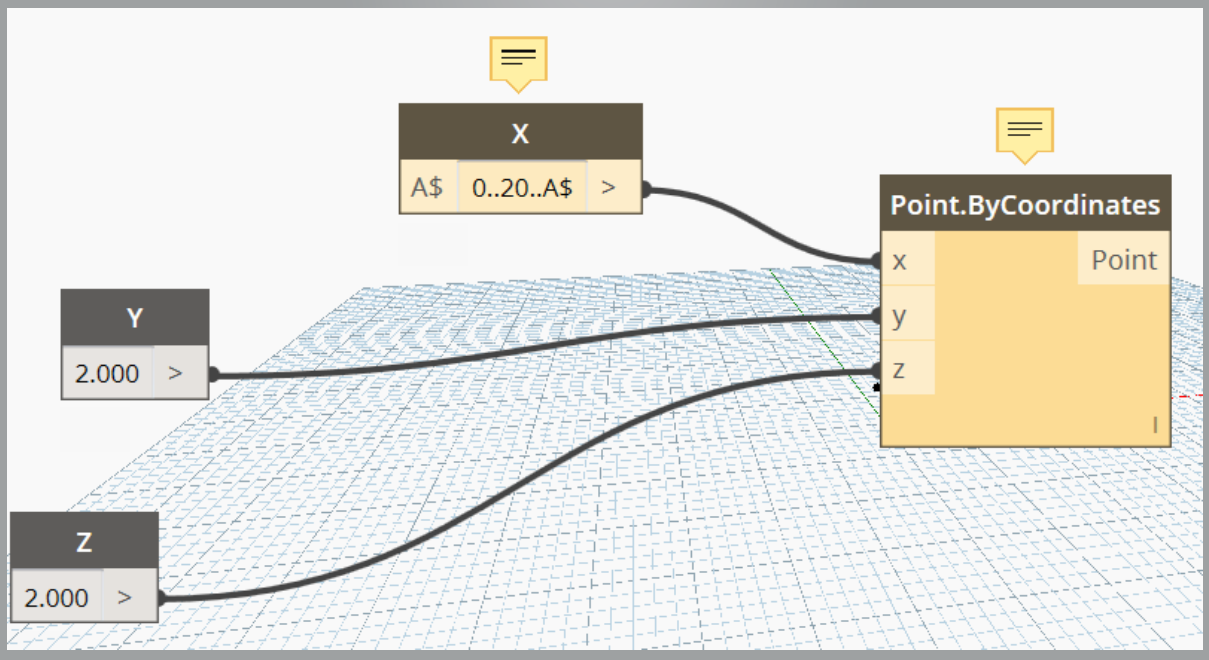
4- In this step, we will rename the points with new names to acknowledge the function of each point, especially if the file is overwhelmed with many points so it’s considered best practice to name each point by an equivalent name. Right click the point and choose “Rename Node” and rename the first point “X”.

5- Using the same method rename the 3 other points to X,Y and Z respectively.



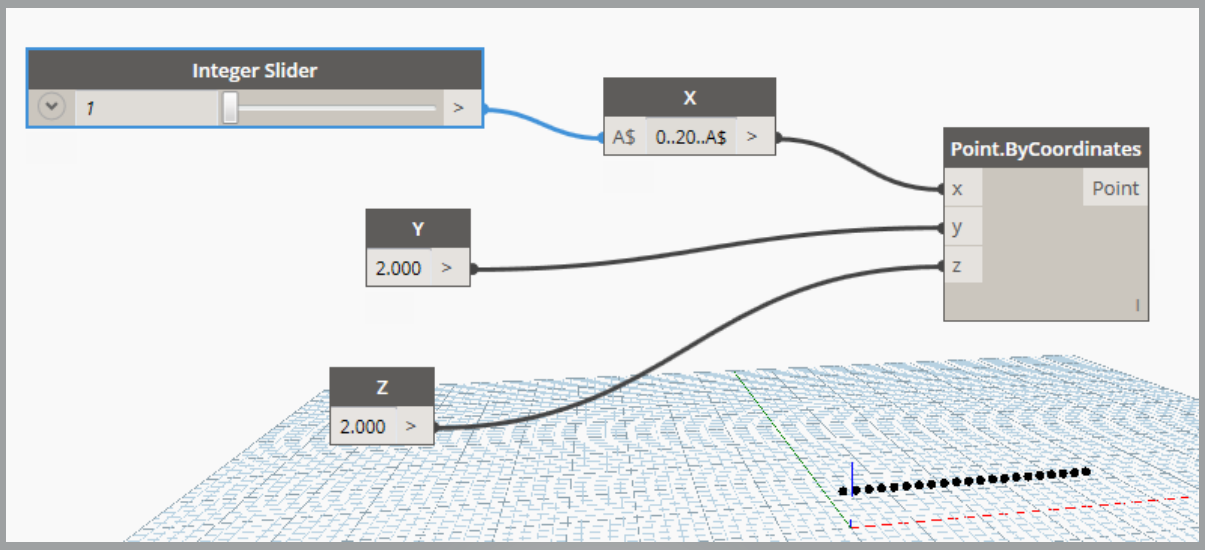
6- Now we need to construct group of points in the same X axis direction.

7- Click on X value and write the following Code "$A..20..0" as shown below:



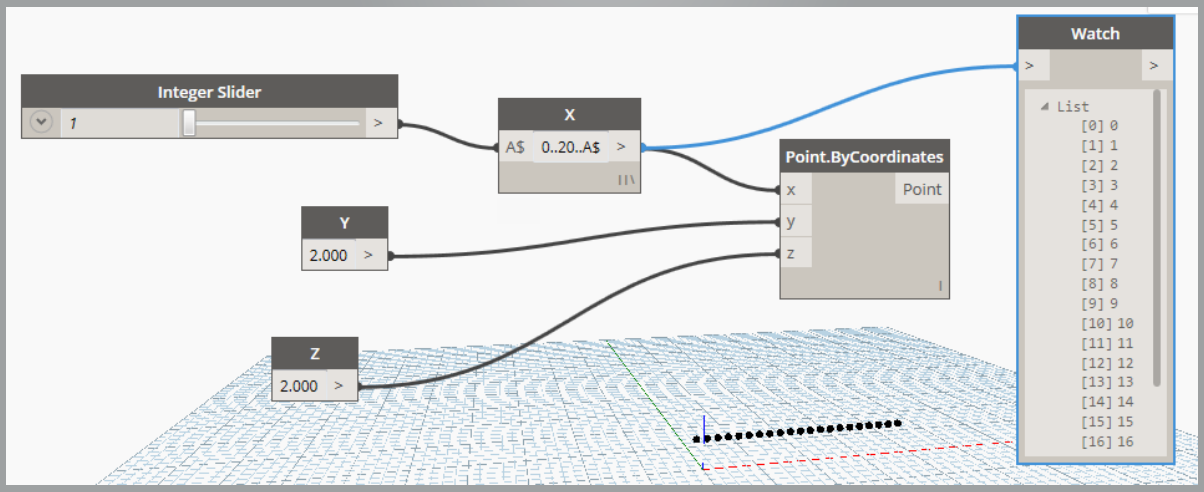
8- These shown rectangles will then turn into pale yellow which gives us an indication of an error in the Dynamo code compiling, as there is no definition of copying and pasting points in the Dynamo interpreter.

9- Fixing this error, add an Integer Slider on the point lying on the X axis as previously shown in the previous chapter.



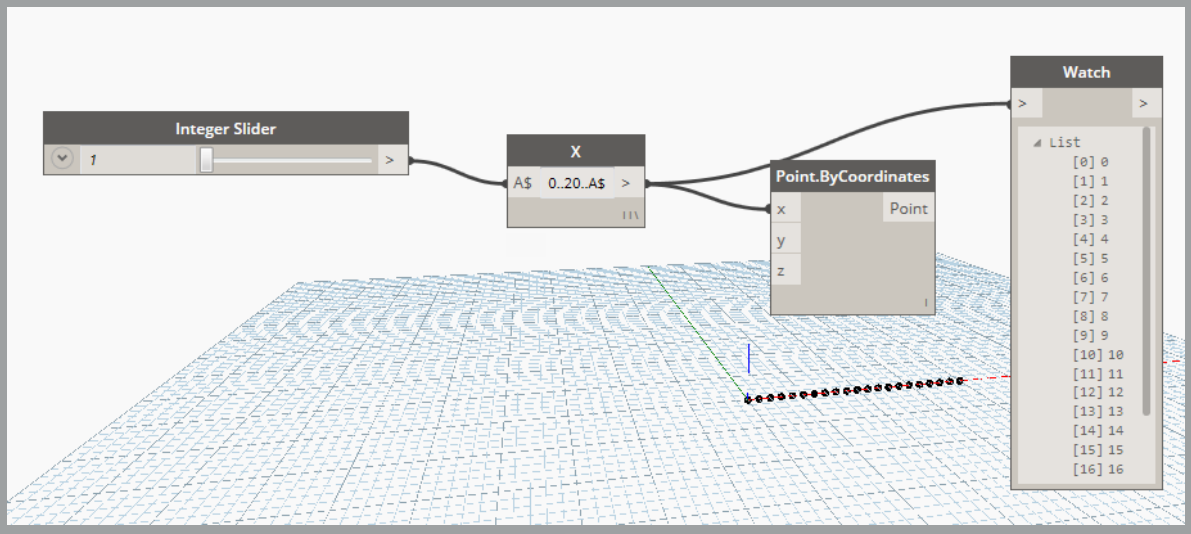
10- Make sure that the Integer Slider is set to 1, this will easily copy the points, also note that each time we increase the Integer Slider number , the number of points decreases.

11- You can use the “Watch” command to list all the points and link the previous point, as shown bellow Dynamo listed all the points that were added...

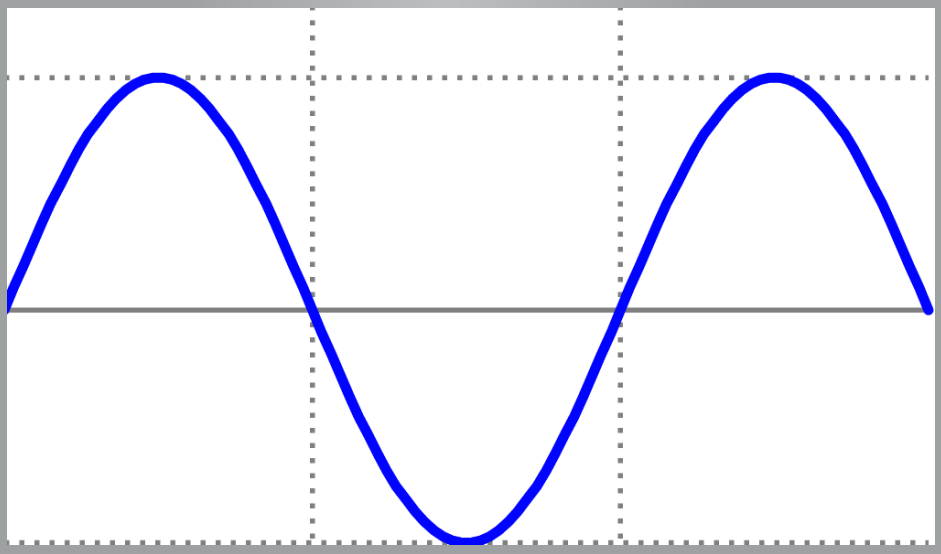


12- After this tutorial on setting points and making lists of a group of points we will simplify this procedure in order to do some more processes.

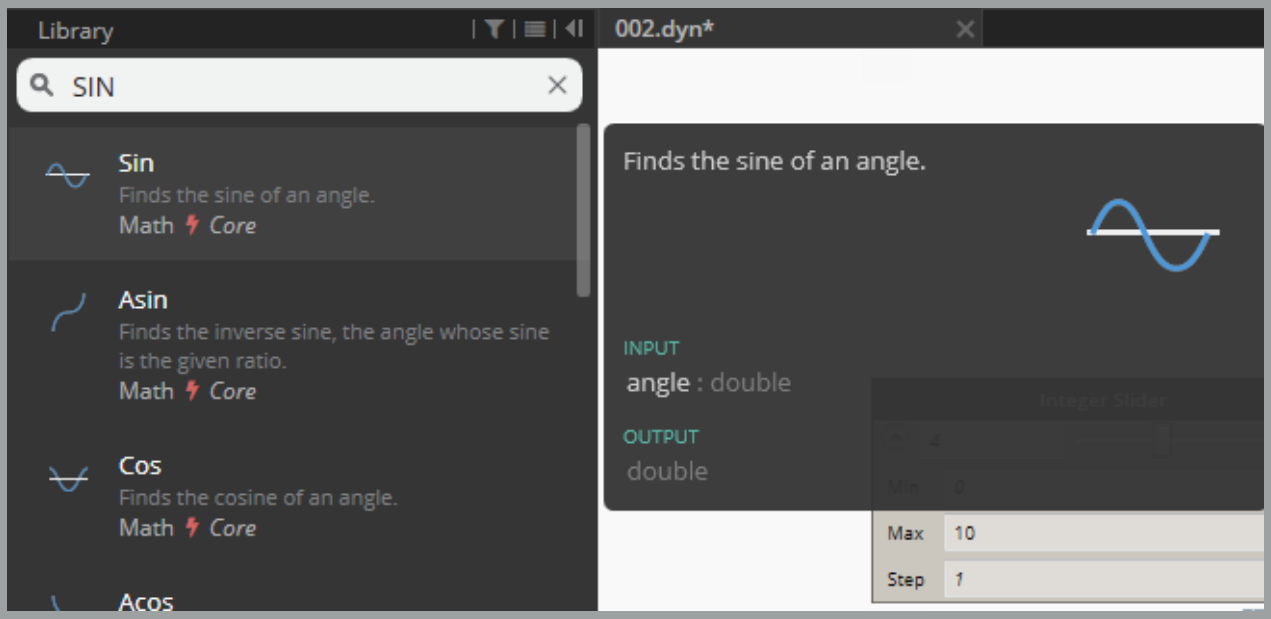
13- You can now delete the Y and Z coordinates, leaving only the X coordinate.



14- One of the excellent features of Dynamo is the ability to use and apply many of the advanced calculations embedding them to BIM workflows, and you can also define and use the famous mathematical formula of the Sine curve.



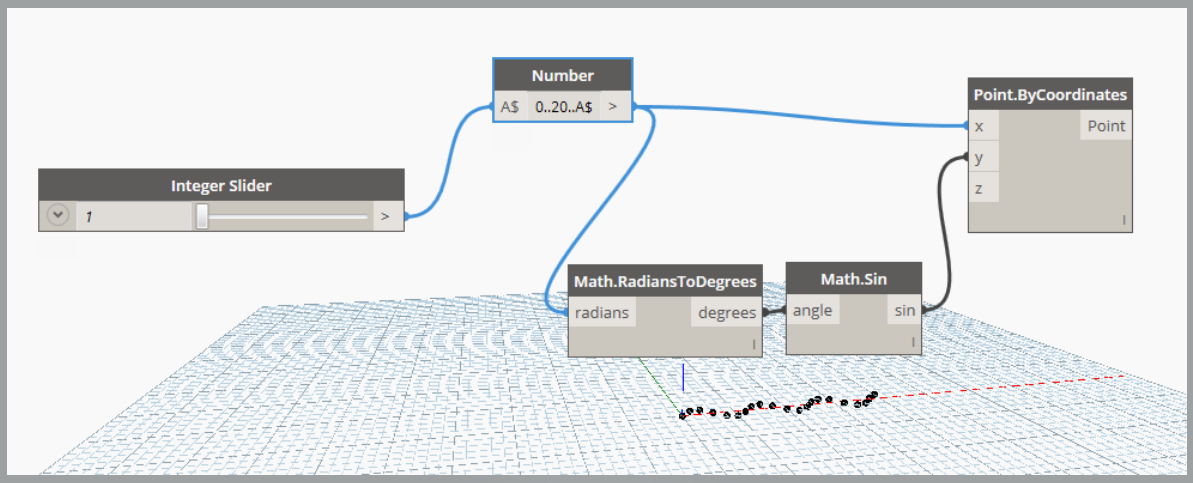
15- In order to do that, search for the sine curve by entering SIN as shown in the search list.



16- You can link the SIN CURVE on the Y axis for the group of points previously plotted, which means that the downward points will be plotted on the Y axis direction giving a sine curve.

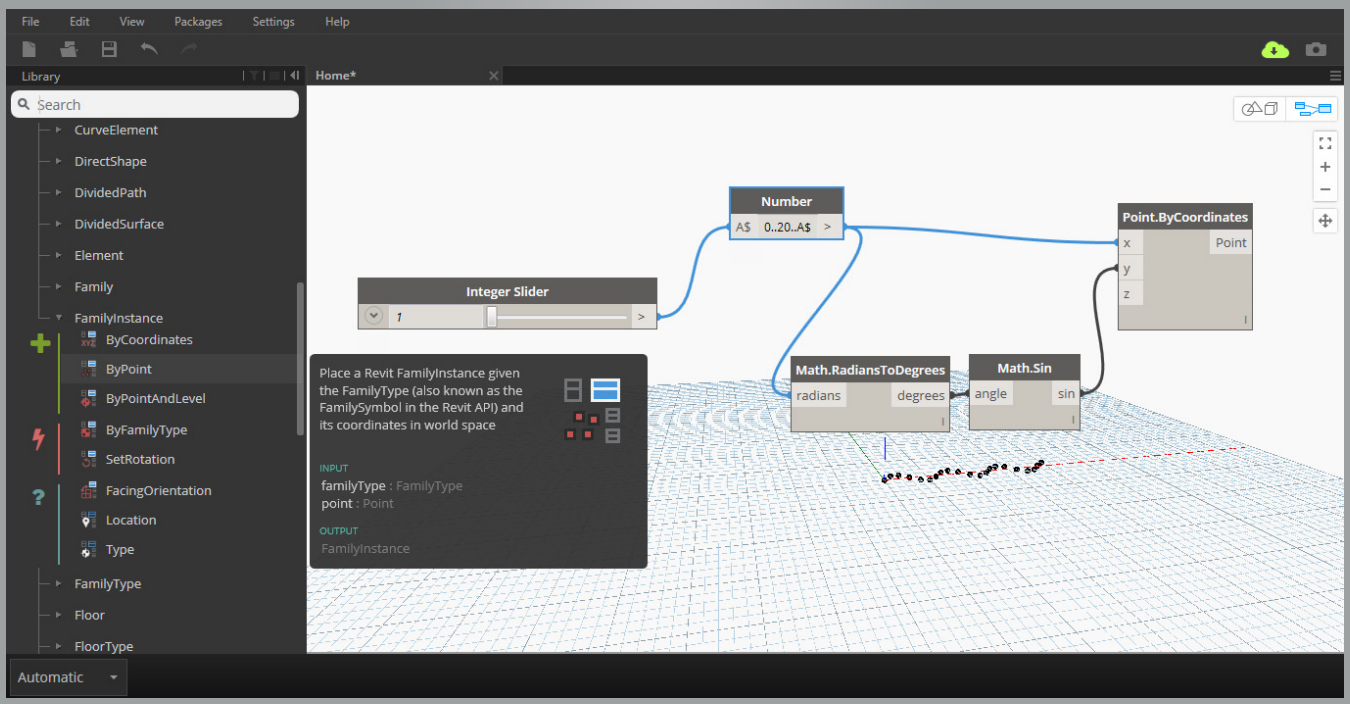
17- In order to control the sine curve's angles, you can set a converter to convert the numerical radians to angle degrees "RADIANS TO DEGREES".

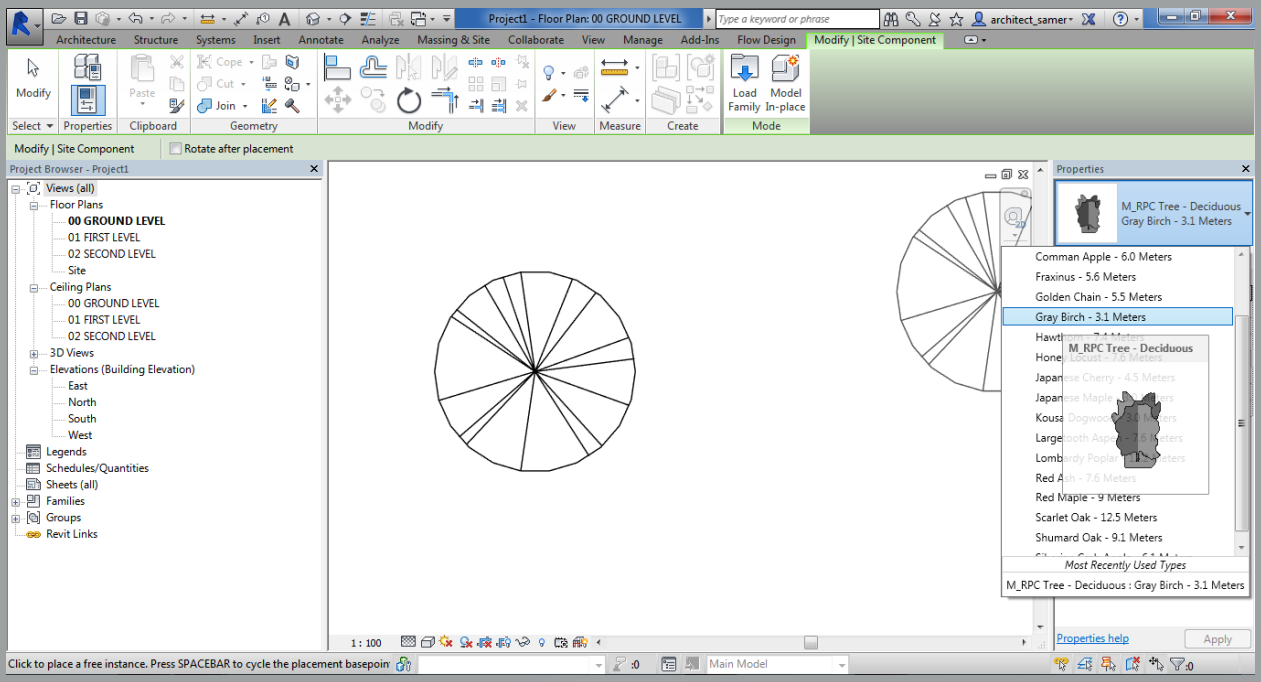
18- You can load some points from the X axis to RADIANS feature, converting them to degrees to produce this setting of lines shown, and the nodes are to be connected as shown in order to have this formation of points (Sin function).



19- Now it’s time to load one of the Revit families…

20- You can use ”trees from site components” after going back to Autodesk Revit to load the required family as shown below:

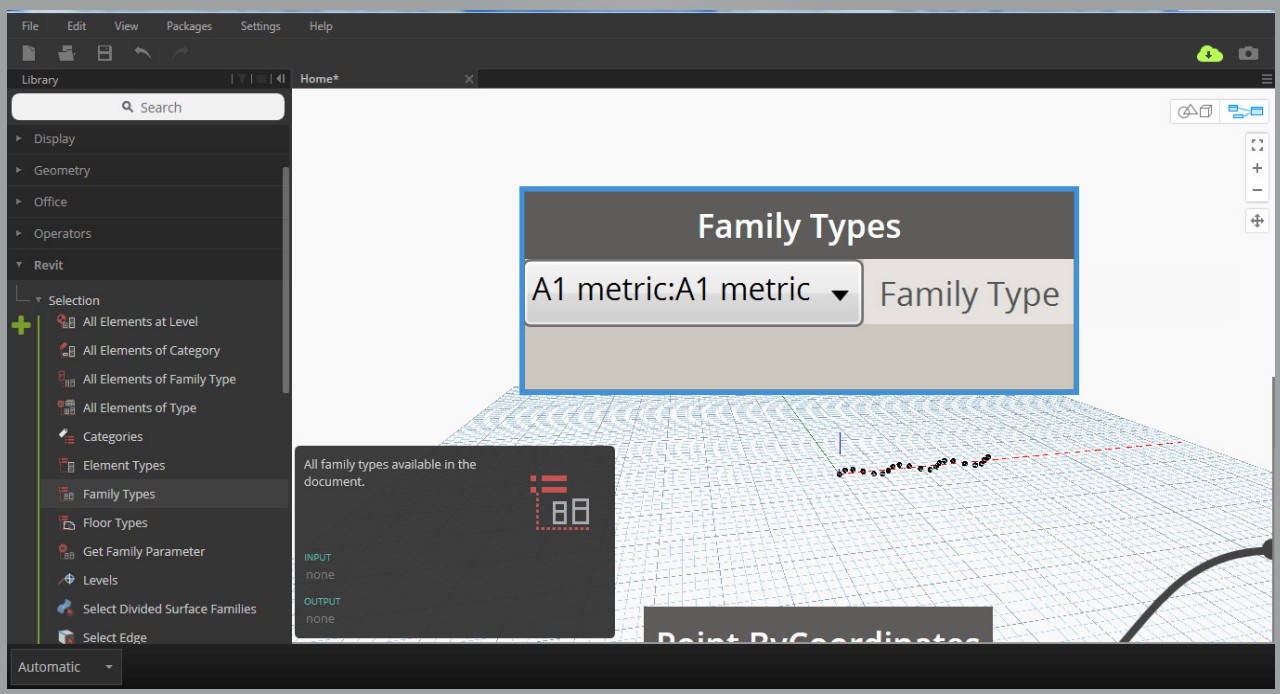




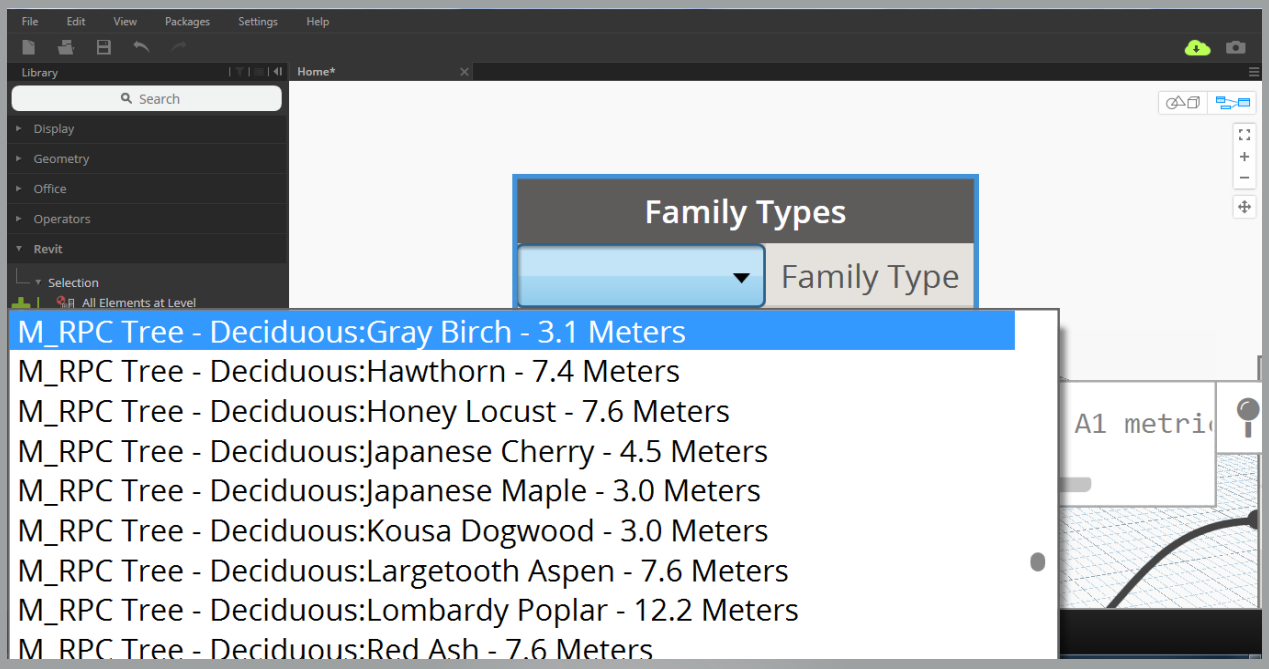
21- Returning back once again to Dynamo, open the “Revit” list select “Elements” then “Family instance” then “By point”. Or directly write family instance then choose “By point”.

This will load the tree drawn in Revit to Dynamo to the previously drawn points to let the tree family attain the same point formation.

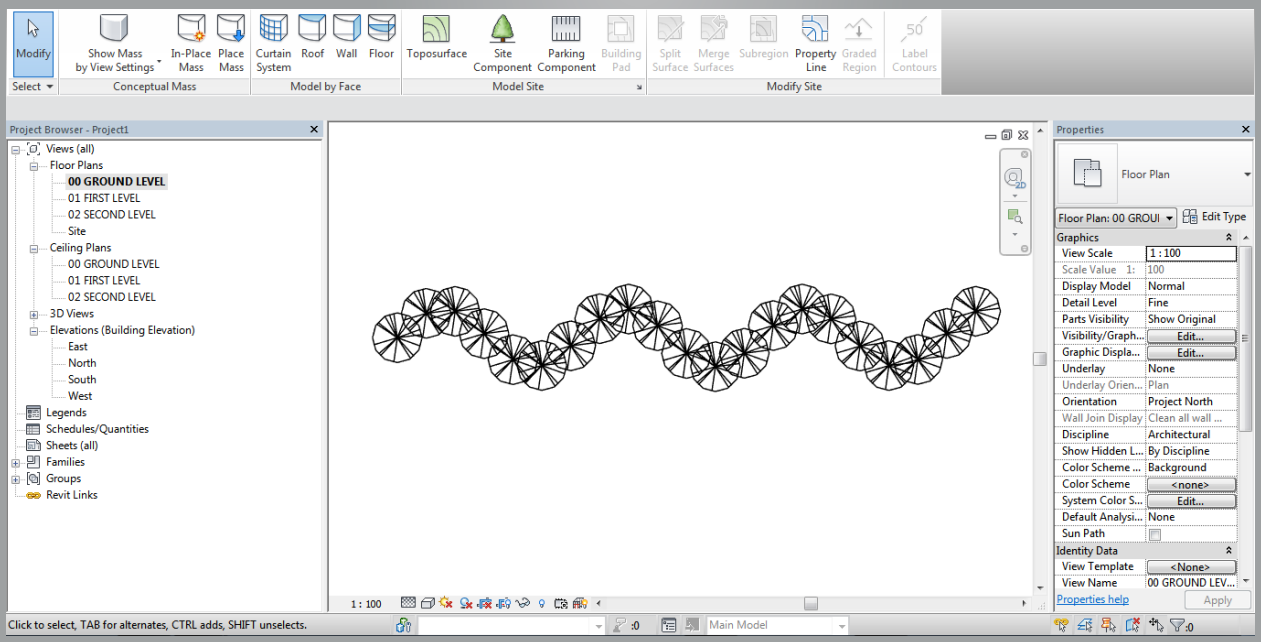
22- In order to load the family of the tree previously selected, choose “Revit” then “Selection” then “Family types” as shown below:



23- A full list of all the family elements in the Revit file will be shown, select the tree family previously loaded, the name of the tree must be known in order to select it from the list.



24- Open the Revit file now, notice that the tree family are set as the point formation (sine wave function) as shown below:



25- You can also repeat the previous steps for any family elements to have the same format as different mathematical formations on Revit, after this lesson, we can easily deduce that Revit features are highly enhanced using Dynamo.

And as always, keep up and practice makes perfect…

Thanks for your time and attention.

Naturally, the consultant is concerned with the quality of the project's design from the engineering aspects, where he tries to present an advanced thought to meet the needs of the client and shows the distinction of design thought. Designers around the world compete in producing amazing designs by the continuous development of a number of design and creative factors, such as, the development of construction techniques and raw materials, and also the increase of cultural communication and environmental awareness. With this development, design determinants have become more complex and mature than before, leading to unique and complex architectural and urban creations. Of course, this system is based on technological development and the enormous potentials offered by programs of design, modeling , and output.

Quality of Design or Quality of Data ?

Written By:
Tamer Abd El-Kader

Translated By :
Dunya A. Aldhaher

But there is a common mistake which many designers conduct , which is lack of interest to data quality , which means the availability of the characteristics that make the data accurate and adequate to show all the details of the design and its components. The visual component often gains more interest over quality of the data specifications included in the design, where the information aspect of the design always takes a secondary role when compared to the geometrical dimension. In fact, the information dimension is what makes the difference between a quality design and a poor one.

When designs compete then information richness rules. But for the strength of the visual component, or because the designs are in their initial stages, so attention to the data in the design is not strong.

Figure 1 3D model of Pico project for Zaha Hadid

So, there is sometimes a confusion between design quality and data quality. To illustrate more, imagine seeing the design of the Pico building in Belgrade for the great architect Zaha Hadid, but in a number of 2D designs! I cannot limit the amount of AutoCAD files you have to see accurately .. It is almost impossible to imagine the design thought and the shape of the architectural masses from those files... Isn't it?

So the golden rule here is:

Quality of Design ≠ Quality of Data

Design quality is concerned with the engineering dimension, and can be achieved by taking into consideration several factors, for example: design thinking, achieving the objective of the facility to meet the needs of users, achieve less energy consumption, less construction costs ... and so on. There are often strong influences from the owner in identifying these factors. But the quality of the data is the quality of the information dimension of the design, and since the product that the designer is presenting is actually an information product - the designer doesn't build the final product, but offers a huge amount of data which in turn moves to the contractor who builds based on how much information is available and how accurate it is from the design consultant. Practically, most of the problems of the construction process result from the lack of quality of the data transferred from the consultant to the contractor. Therefore, attention must be paid to the information dimension in addition to the attention of the engineering and creative dimension of the design.

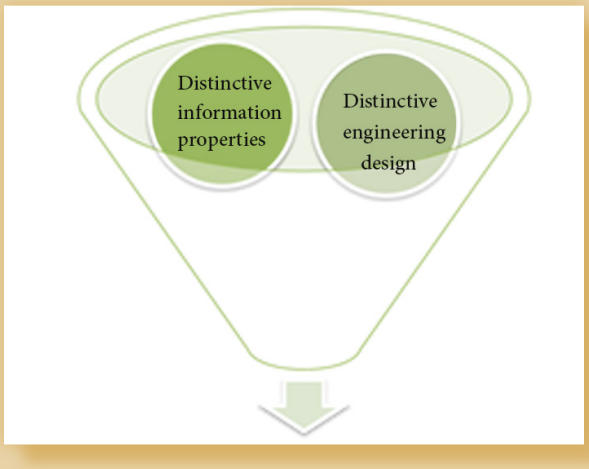


Figure 2 a distinctive design product

What are the data quality elements?

Unlike the quality of the design, the quality of data does not vary depending on the quality of the project. Data quality elements include technical elements, such as, file quality, modeling's accuracy; metadata, geographic and technical specifications of design components. As well as, elements related to the sharing of data, such as, extensions and formulas, levels of enabling between the parties involved and so on. The following table summarizes some differences between quality of design and quality of data:

	The Quality of Design	The Quality of Data
The goal	Producing engineered design	Producing data that illustrates the design thought with details of its various components
The influential elements	Depends on engineering rules and design standards	Depends on drawing and modeling standards
The success factors	For example but not limited to Distinguish the design idea Form of design masses and their relation to space and surrounding environment Meet the needs of users Lower power consumption Design flexibility and suitability for different variables	For example but not limited to Integration with different data formats Extensions Accuracy of representation Data is completed Metadata is completed
The outputs	Crocs Options for design ideas Initial design Detailed designs Detailed and analytical reports	3D models Horizontal and vertical plans Horizontal and vertical sections Tables and graphs Detailed drawings
The requirements	Different Engineering Sciences	Knowledge of the rules of building and sharing data Skills of representation, modeling and data entry
The main player	Design engineers	IT officials Modeling and design team

Therefore, the modern trends drive the design consultants to have an innovative role at the end of the design process, which is the role that responsible for the quality, accuracy and completeness of the data prior to their participation with all parties involved in the project.

BIM Statistics Research in Jordan 2016

Eng. Amer Hijazi
Eng. Hasan Omar

Amr Rizk

This article will discuss the results of the practical research presented by (eng:Amer Hegazi and eng:Hassan Omar) from (A&H group) company, which consider a continuity af the previous scientific research which was presented during 2015 at (BIM the measure of success conference) held by the Jordanian engineers association-department of international relations and business development.

The participation in this year's Second Modeling Conference was a review of the results of the research, which will be a guide to the stages of development of modeling science in Jordan and the strengths and challenges that must be worked on in the coming period. It is worth mentioning that it is the only research at the level of Jordan that deals with the statistical results associated with modeling and its applications.

1- The research included the following engineering sectors :

Questionnaire 2016 includes The following Sectors

This gives the overall importance of the research and the need to raise the awareness of the government sector, the scientific and educational bodies, the private entities and companies in Jordan to help raise awareness in the field of building modeling. The modeling includes all engineering units and has a positive impact in all fields in parallel. With challenges as well.

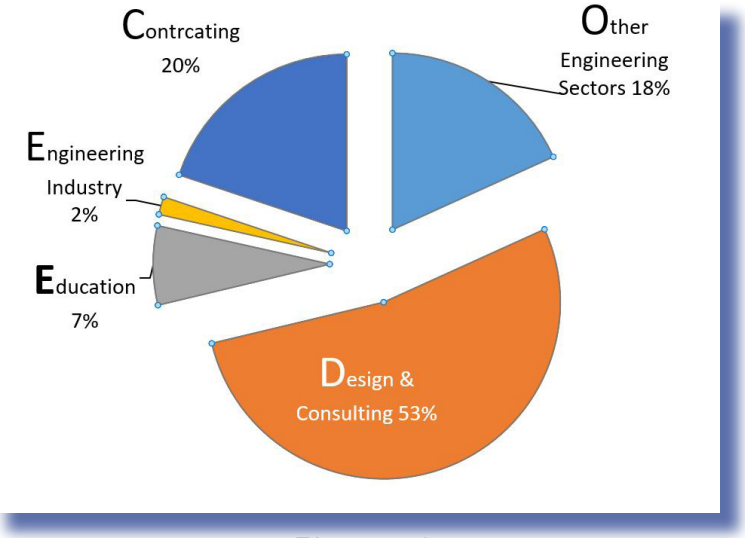


Figure -1

2- Comparison between 2015 and 2016

In the year 2015, the knowledge of modeling was 38%, while the percentage increased to 55%. This is indicative of the acceleration of modeling and information technology in the world in general and in Jordan in particular, and the presence of a large number of local and global consultants in Jordan, Jordanian and Arab engineers with the global engineers.

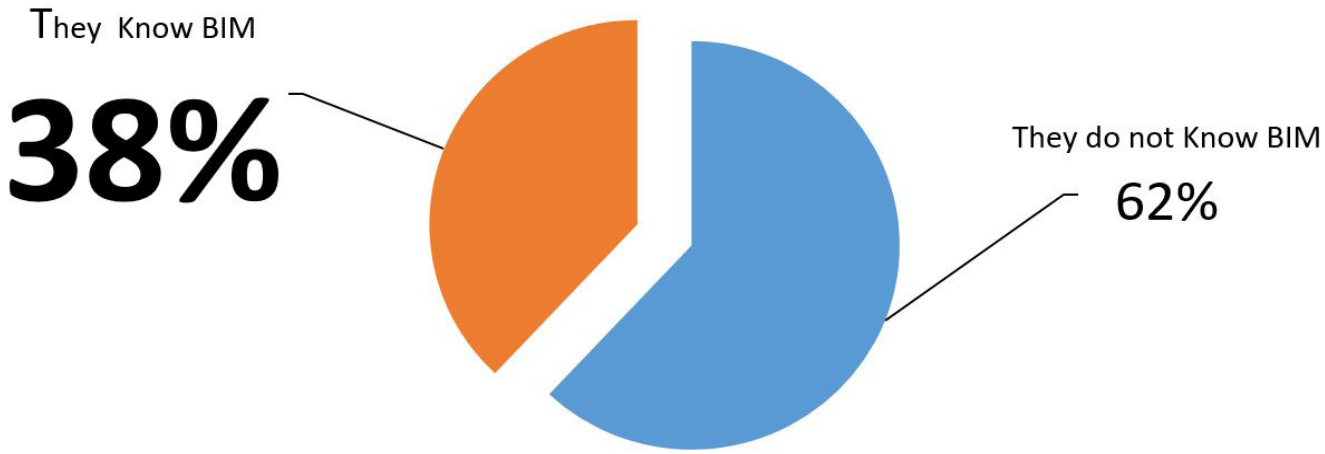


Figure -2: shows the Comparison between 2015 and 2016

And here comes the most important question, which is the most important bodies that contributed to the dissemination of this knowledge in the engineering field and what proportion of that participation, where the scientific unions occupies the largest proportion, while the universities accounted for the lowest proportion,

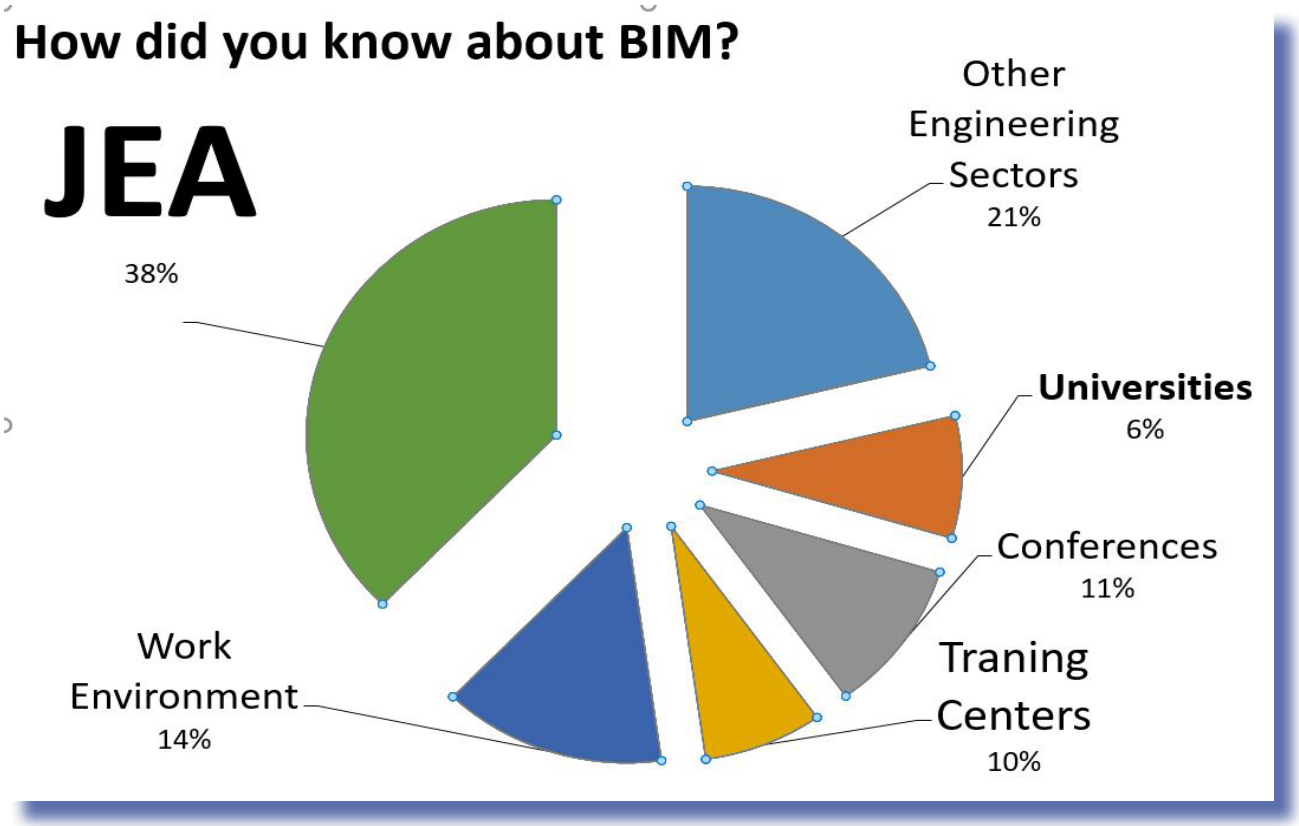


Figure -3: Questionnaire about: How did you know about BIM?

3-In the statement proportion of application modeling in engineering companies in Jordan (BIM Implantation):

And in the statistical analysis based on the (chi square principle)

	Category 1			Category 2			Marginal Row Totals	
Group 1	220	(191.06)	[4.38]	111	(139.94)	[5.98]	331	
Group 2	150	(178.94)	[4.68]	160	(131.06)	[6.39]	310	
Marginal Column Totals			370			271	641	(Grand Total)

The chi-square statistic is 21.438. The p-value is .000004. This result is significant at $p < .05$.

It was found that modeling knowledge alone is not enough to apply modeling rules and software throughout the company. We need to know and understand BIM implementation steps to enable modeling to be applied at all stages of the work.

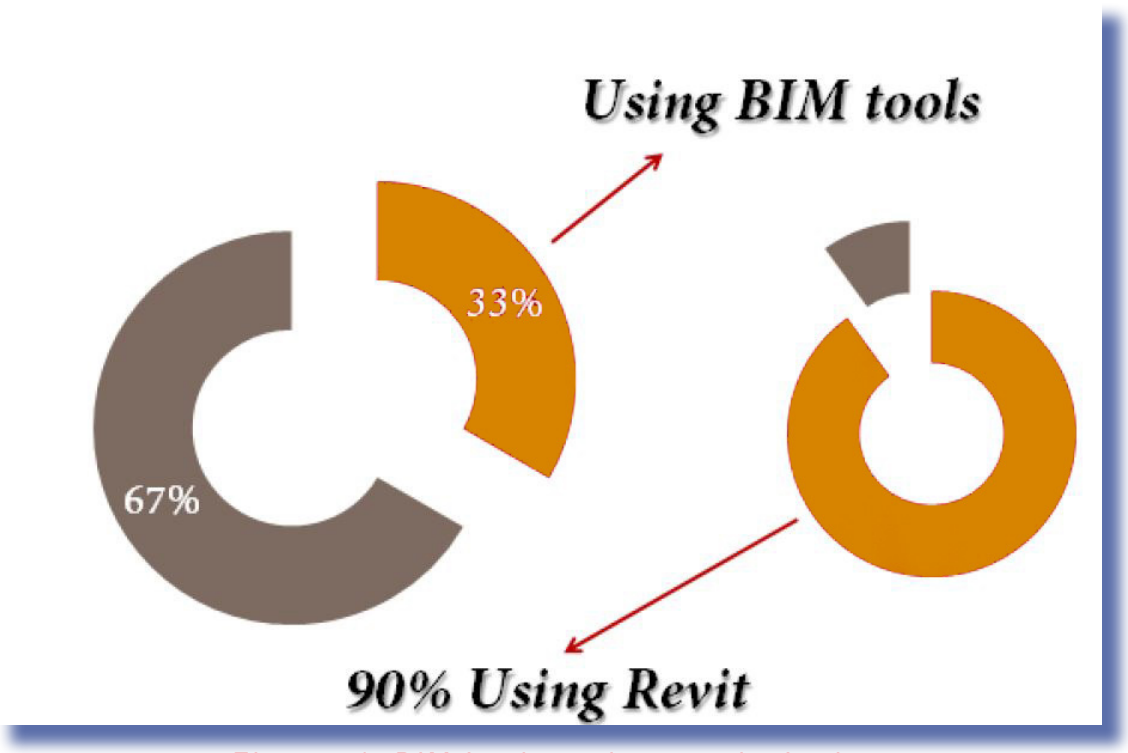


Figure -4: BIM Implantation rate in Jordan

As for the software used in modeling and for which engineers can work on, the ratio is as follows

4- It is also important to highlight the biggest obstacle to the transition of the engineering sector from companies and engineers to modeling

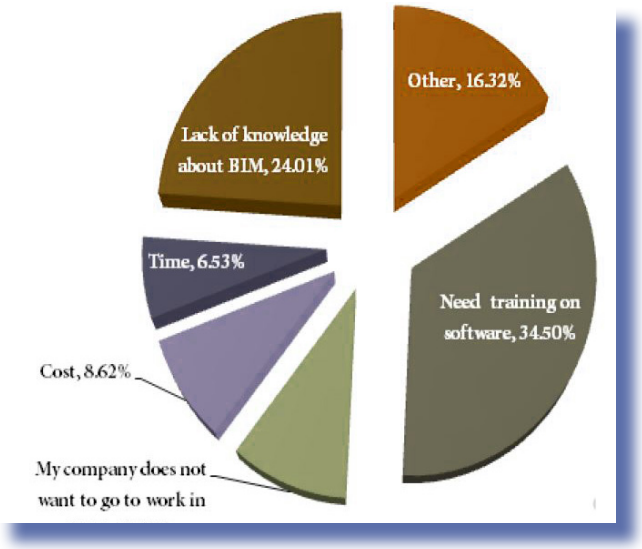


Figure -5: The biggest obstacle to the transition of the engineering sector from companies and engineers to modeling

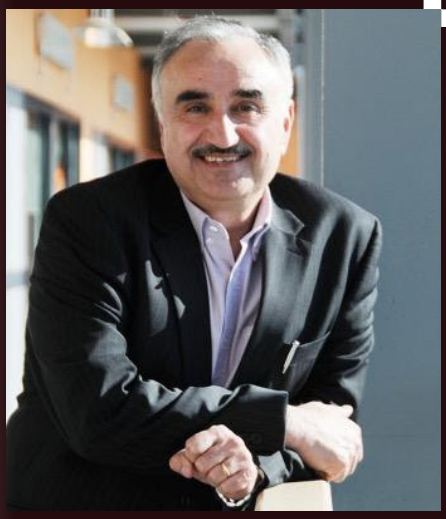
The biggest challenge was the need for training on modeling software with 34.5% followed by the importance of knowledge of modeling science and its management by 24%, while the cost of material and time was a small percentage compared to previous ones.

Hence the importance of scientific research to be a link between the reality of the companies and the engineering sector and what we look forward in the field of engineering progress and development in order to build a competitive society.

For more details, please visit:

http://www.ahgroupjo.com/bim.html

Whole Lifecycle Information Flow Underpinned by BIM in Qatari Construction Industry: The 'Project DNA' Concept



Dr. Nashwan Dawood

Abstract:

This paper highlights the 'project DNA' that enables whole life cycle information flow in a construction enterprise. The 'project DNA' developed in this paper uses the concept of human 'DNA, Deoxyribonucleic Acid'. As we learned from nature, human DNA carries genetic information over the whole life cycle of a human beings and all living organisms. DNA encodes all the fundamental and distinctive characteristic of someone or something. This concept has been adopted for the development of whole life cycle information flow in general and to Qatari construction industry in particular.

The process of encoding all construction project information characteristics is not only difficult but also almost impossible due to the nature of procurement and development of projects and the lack of information /process standardisation. However, an attempt has been made in this paper to develop a framework and processes for encoding WLC information flow underpinned by Building Information Modelling at very early stages of project development.

Keywords: Project DNA, BIM, whole life Cycle information, CAD, processes, Policy

1. WHOLE LIFE CYCLE INFORMATION FLOW IN CONSTRUCTION PROCESSES: THE CONCEPT

This paper defines construction information lifecycle as the seamless, continuous and consistent flow of information from one processes to another without having to re-create or correct information for each process. But rather adding value and reduce information redundancy across the processes. Current practices in the industry suggest

that as project development proceeds from one process to another, information is lost in the transition. The ultimate goal in the whole life cycle information flow concept is to minimizes information loss to zero and efficiency is gained by re-using and adding value to information from one stage to another.

Figure 1 demonstrates this very well, information value is plotted against Royal Institute of British Architect (RIBA) construction processes and as project moves from one process to another, a drop in the value of information is being experienced and this due to the lack of understating of the information needed for each process and the standards that support this. As shown in figure 1, the ultimate goal is to have zero drop of information value and each construction process fully utilizes information generated from previous processes and add value to the next process, the red curve in figure 1. In order to achieve this, knowledge and understanding of all processes need to be encoded in the project initiation stage and this is where we can learn from the concept of DNA to minimize inefficiency in information flow across project life cycle.

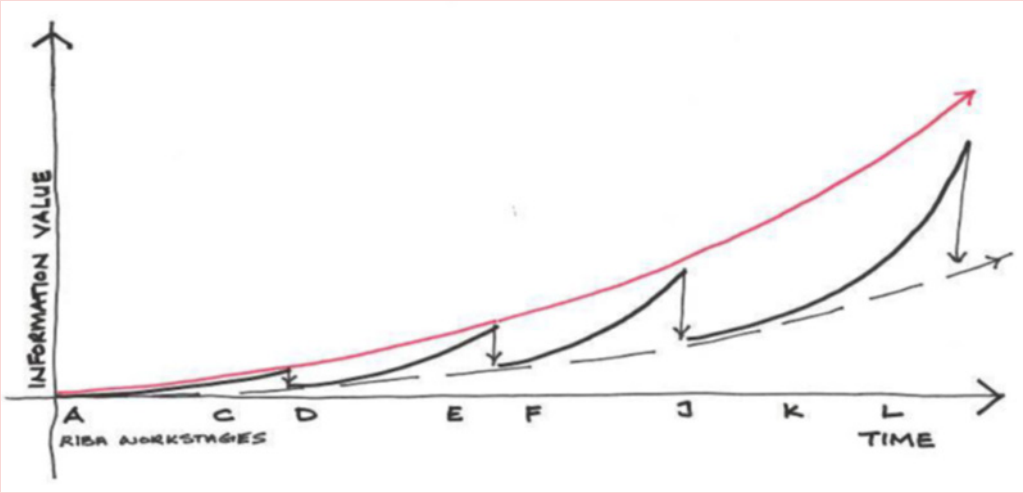


Figure 1, Information value is lost in the transition between building project work stages

To augment figure 1, figure 2 shows the concept of development of construction projects throughout the RIBA processes and how a project is being developed. Main operations where whole life cycle information need to be developed and considered:

a) inception / design / production, this includes creation of a construction entity from initial concept up to occupation by its users. Project stages might include inception, design, production information, tender, construction, commissioning.

b) use / maintenance. This includes Maintenance/servicing of a construction entity over a given period. Project stages might include specification, tender, maintenance.

c) refurbishment / alteration / re-commissioning, project stages might include inception, design, production information, tender, construction, commissioning.

d) decommissioning / demolition. Project stages might include documentation, tender, demolition

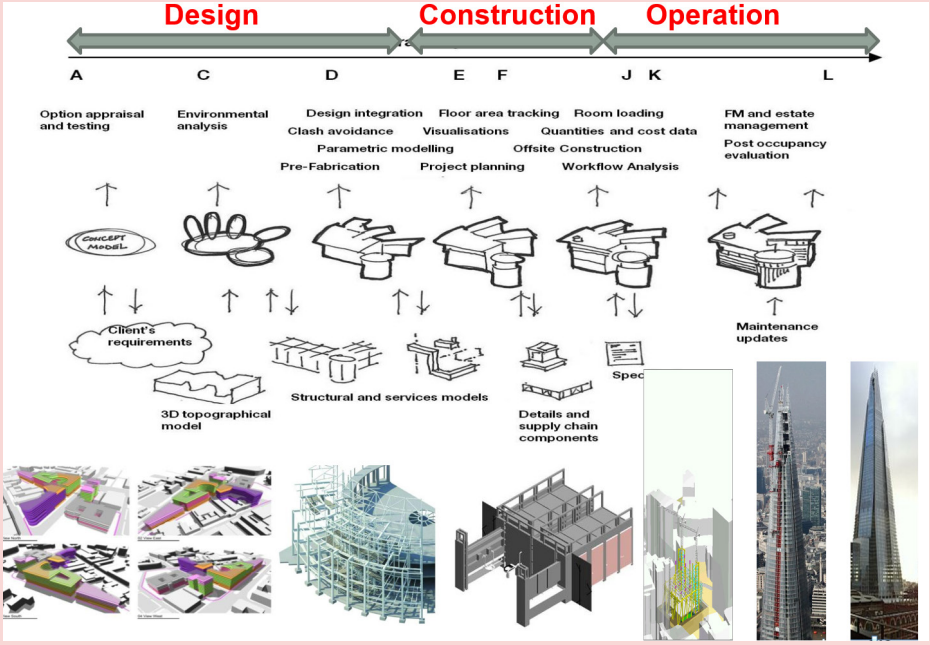


Figure 2, Whole life cycle information flow concept

We consider lifecycle information flow enabled by Building Information Modelling (BIM) as a set of rules, represented graphically through process maps, or in writing, to enable a consistent and continuous use of building information from the design stage, through the construction stage, to the facility management stage, while reflecting the policies and being enabled by an adequate IT infrastructure. Such definition mostly agrees with the literature, defining building lifecycle information management as “the integrated coordination, organization and control of all of the information about a building project in advance of its design, construction and the day to day operation of the building until and including its demolition” (Riese, 2010). To further develop the subject area, this paper argues that whole life information flow is not only integration and coordination information for design or construction processes but also s utilizes most of the information/knowledge generated in particular RIBA stage for the next stage. One of the issues with construction project development stages is that information generated in previous stages, in some cases, has little value to the succeeding stage.

In this context the aim of this paper is to introduce and discuss a framework that enables the whole lifecycle information flow underpinned by BIM. The framework is composed of four pillars: processes, technology, policy and people. These are developed concurrently and are highly dependent on each other. Figure 2 shows the processes embedded in each of these pillars.

The technology pillar consists of a classification of BIM technologies, according to their functions such as: design, analysis, management and review technologies. The mapping of technologies on to project processes should assist in linking BIM deliverables to suitable BIM technologies and interoperability requirements. Technologies can include:

- Identify detailed functionalities needed: this to include design, programme, analysis, manage and review.

- Map current available tools onto the functionalities identified and create technology diagram and where possible identify data exchange/interoperability.

- Create detailed protocol manual that will include detailed instructions about setting up a collaboration server, model sharing rules, modelling instruction for each functionalities.

- Provide training and continuous assessment.

2. THE UK CASE OF ADOPTION WLC UNDERPINNED BY BIM

The United Kingdom has been active in developing whole life cycle information flow strategies and BIM policies for improving the performance of its construction industry. In May 2011, the UK Cabinet Office published its "Government Construction Strategy" which emphasized the need to develop standards for enabling all members of the supply chain to work collaboratively through BIM. The strategy also announced that the "Government will require fully collaborative 3D BIM (with all project and asset information, documentation and data being electronic) as a minimum by 2016.

UK BIM government strategy is based on 7 element and some of these have been already delivered:

- PAS 1192-2:2013 *Specification for information management for the capital/ delivery phase of assets using building information modelling (see figure 2)*

- PAS 1192-3:2014 *Specification for information management for the operational phase of assets using building information modelling.*
- BS 1192-4 Collaborative production of information. Part 4: Fulfilling employers' information exchange requirements using COBie – Code of practice.
- Building Information Model (BIM) Protocol
- GSL (Government Soft Landings). This is about FM requirements are embedded and incorporated in BIM.
- Digital Plan of Work.
- Classification.

The main element of the whole life cycle in the UK BIM strategy and has the potential to embody the concept of project 'DNA' is Employer Information Requirements (EIR) which is well presented in PAS 1192:2, see figure 4.

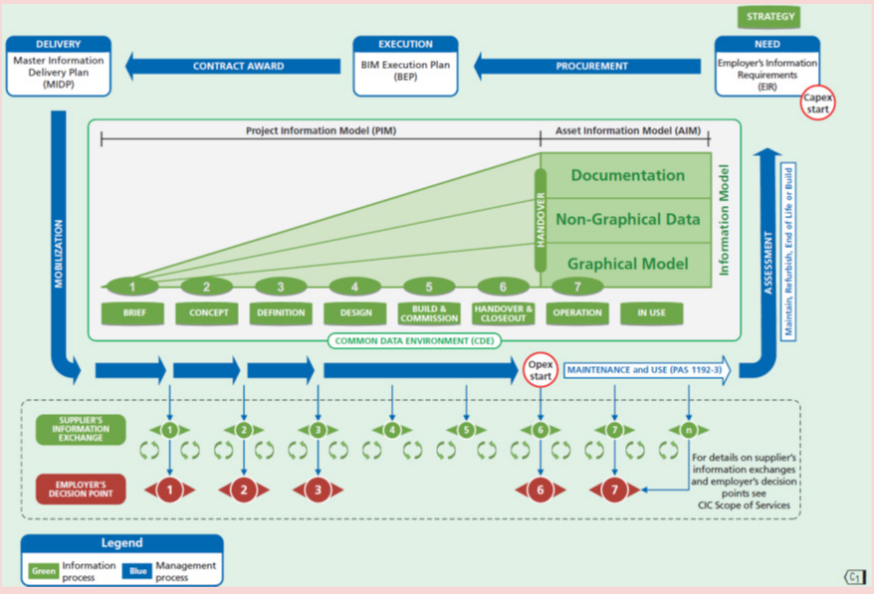


Figure 3, Building lifecycle information delivery as defined in PAS 1192-2 (BSI, 2013)

Main components of EIR are presented table 1.

Table 1. EIR Guidance notes by BIM Task Group

Table 1. EIR Guidance notes by BIM Task Group		
Technical	Management	Commercial
1. Software Platforms 2. Data Exchange Format 3. Co-ordinates 4. Level of Detail 5. Training	1. Standards 2. Roles and Responsibilities 3. Planning the work and Data Segregation 4. Security 5. Coordination and Clash Detection process 6. Collaboration Process 7. Health and Safety and Construction Design Management 8. Compliance Plan 9. Delivery Strategy for Asset Information	1. Data drops and project deliverables 2. Clients Strategic Purpose 3. Defined BIM/Project Deliverables 4. BIM-specific competence assessment

See you next edition

BEHIND EACH PLIGHT IS A GRANT

The Arab countries are going through a challenge in the currency, where the currency of some countries is falling for the dollar, which causes a problem and inflation.

How can we (at the personal level) turn this curse into a bless and turn lemon into juice?

We can do this through competition in the European and US markets in more than one way.

* Through freelancing sites that link those looking for freelancing work with business owners.

Who searches for someone to finish his design.

Your competitors are mostly Indian, asking lower rates, but you are of good work quality and you can compete with a reasonable rate due to the collapse of the value of the local currency

Best sites for this:

http://elance.com
http://freelancer.com

Here you will find two experiences for this:

https://draftsman.wordpress.com/2015/01/19/samar-sobhy
https://draftsman.wordpress.com/2015/01/31/samar

* Through the establishment of a company, send a profile along with previous jobs done to European companies and try to hunt for a good rate job for both of you. Many began before you and won fold times what they used to make, behind each plight is a grant.

The other thing is that we're turning articles into audio clips, so you can listen to them on your way or at work.

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